AUSTRALIAN SOCIETY FOR LIMNOLOGY

NEWSLETTER

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Australian Society for Limnology

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Australian Society for Limnology Newsletter

Volume 25 Number 4 November 1987

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Copy deadline for next issue:

Material for publication in the February issue of the Newsletter should be sent to the Editors before 15 th January 1988.

The Australian Society for Limnology is an association of over 400 people with professional or amateur interests related to Australian inland waters. Since its inception in 1961, the Society has played an important role in fostering limnology work in this country. The ASL promotes liaison between limnologists in academic, private and governmental institutions and has a vested interest in the conservation of aquatic and related resources. Annual conferences are held near centres of limnological interest, and the programme includes scientific sessions, field excursions and social activities.

The ASL produces a newsletter with notes on activities, articles of general interest, book reviews and conference announcements: a Bulletin of original scientific papers and occasional Special Publications. A further publication is the Directory of Australian Limnologists.

Membership details

Membership applications are welcome; five classes of subscribing membership are available:

Ordinary Members:	$20.00
Student Members:	$10.00
Life Members:	$200.00
Institutional Members:	Fees on application
Sustaining Members:	Fees on application

Membership subscriptions cover the period from 1 July to 30 June and members receive all publications. Members may also choose to receive the Australian Journal of Marine and Freshwater Research, the Australian Journal of Zoology and/or the Australian Journal of Botany at reduced rates. The subscription period for each journal is the calendar year following the year in which the subscription is paid.

Enquiries relating to membership should be directed to:

Mrs M. Hart
Treasurer/Membership Officer ASL
22 Netherby Avenue
Mulgrave Vic. 3170

EDITORIAL

This is our second Newsletter and we are still amazed at how Michele Barson managed to do it all by herself. The response to our first attempt was marvellous - we even got unsolicited fan mail and, so far, no rude comments. Thank you for your support and many thanks to the people who have sent letters and news in. The apathetic cynics among you will probably be grumbling that its the same old crowd doing the contributing. This can be easily overcome by desisting from the apathy and sending something in. We are especially disappointed at the lack of correspondence from the "ordinary members" on the mooted restructing of A.S.L. The A.G.M. is on in a few months folks, and there are members of the executive who you can talk to in most states, so get thinking and writing: how can A.S.L. better serve its membership?

This issue is a bit slimmer than last time, since we don't have all those abstracts to cram in. The gossip column, STATE AND TERRITORY AFFAIRS, proved popular and we hope that everyone will see that it is in their own interests to contribute. The big event that receives some attention in this issue is the recent AWRAC seminar on national priorities in water research. As reported in the last newsletter AWRAC has funded a number of centres for research, and perhaps the Newsletter should consider running substantial articles on each in turn in the future (what do you readers think?). Anyway, things limnological are getting rather more of a look-in on the federal funding dollar than has been the case in the past. It could get better or worse (much worse) depending on how we limnologists respond. We would like to look forward to some lively intelligent debate on where limnology fits into the Big Issues in the Newsletter. That is why we have given the AWRAC seminar some detailed coverage. We would like to hear from both limnos and managers what they think of all this and, again, the message is: get scribbling. Finally, we draw your attention to the details of our next Congress in Townsville, the spiel on the student travel award and the Freddo frog competition in STATE AND TERRITORY AFFAIRS. Keep the news rolling in.

THE NEXT ASL CONGRESS

by Richard Pearson

The 27th Annual Congress, Townsville, 13-15 May 1988. Preliminary Notice:

The Congress will be held at Magnetic Island - paradise, five miles from Townsville. We have booked the Arcadia Resort which is attached to the Arcadia pub (cheers) and is situated only half a minute's walk from either Geoffrey Bay beach (good walking, fossicking, snorkelling) or Alma Bay beach (great swimming). Given a good wet season there may be some fresh water on the island (temporary streams, and a shallow lagoon); in any case we expect to arrange field trip(s) on the mainland after the conference (in the AVCC common vacation week).

Accommodation has been booked at the Arcadia Resort and at Hotel Magnetic, Picnic Bay (6 km from Arcadia). Low cost accommodation is available at Horseshoe Bay (4 km from Arcadia), in on-site cabins or in your own tent. Camping elsewhere on the island is not permitted but should you wish to have a snooze on one of the many beaches..... For those not staying at the Resort, various forms of transport are available. We will be providing buses, but individuals may wish to hire a moke (about $25 per day) or an 8-seater van ($47 per day), a moped or cycle (prices not to hand) or to use Shanks's pony. You can take your own vehicle to the island ($65 for the return trip).

Costs are expected to be of the following order: Registration (includes lunches, a.m. and p.m. teas, ferry ticket, etc.) $40
Annual Dinner (Saturday).....$25
BBQ (Sunday) (including band and drinks).....$20
Accommodation (per person, per night; breakfast extra, from hotels ($6-$9) or cafes): Arcadia (twin share)..... poolside....$26 terrace.... S30 Picnic Bay.....(twin share)....$20 (3-4 per room)....$13 Horseshoe Bay 4, 8 or 10 per cabin.....$8 camping .....$5.

The weather in May should be superb: the average minimum and maximum temperatures for that month are 17.5 and 27.5°C; mean daily sunshine is 7.3 hours; sea temperature has fallen to about 25°C. More details, booking forms, call for papers etc., will be distributed in the February newsletter. In the meantime, you can address any queries to Richard Pearson, Australian Centre for Tropical freshwater Research, Zoology Department, James Cook University, Townsville, Qld 4811; 077-814540.

STUDENT TRAVEL AWARDS

Oi! stoodents! money! Having grabbed your attention with one of the two keywords that are guaranteed to solicit the attention of Australia's up and coming limnological elite, we would like to draw your attention to the fact that (a) some money is available to defray your travelling costs to far flung Townsville and (b) that students have been singularly reticent in applying for this money in the past. So here for your information now are the rules governing the awards so that you can start marshalling results and abstracts by March 1st next year. A.S.L. sets aside $1000 each year to be divided up amongst a maximum of 5 students according to their needs. Please note that we have given you plenty of notice about conference dates so that you can take maximum advantage of cheap fare deals. Don't send your abstracts in yet, wait until the formal call for papers arrives early next year. Meantime, read this, make sure you are a member of A.S.L., and don't underestimate yerselves!!

"Okay . . . On the count of three everybody rattles."

RULES FOR STUDENT TRAVEL AWARDS

Assistance by ASL for Limnology Research Students to Present Research Results at the Annual Congress: Applications are invited from limnology research students for assistance in meeting the expenses associated with attendance and presentation of a paper on their work at the 27th Annual Congress of the Australian Society for Limnology to be held on Magnetic Island near Townsville, Qld, on May 13-15, 1988. The purpose of this assistance is to bring the results of significant limnological research in Australia to the attention of those who can make use of it. It is also aimed at encouraging students to present the results of their work in public. The following rules apply to this assistance:

1. Assistance shall be granted on the recommendation of a panel of three appointed by the Society.
2. A maximum of five awards to a maximum total of $1000, depending on the location of the student in relation to the congress venue, will be made each year.
3. Applicants must be full-time postgraduate students at any Australian University, College of Advanced Education or Institute of Technology. There is no age limitation. Applicants must be current financial members of the Australian Society for Limnology.
4. Applications will be invited from students who are carrying out fundamental or applied research in any branch of limnology for the purpose of a higher degree.
5. Applications shall include a written statement of no more than 2000 words describing the research currently under study, its significance to the community and the stage that has been reached. This statement must be endorsed by the Student's Supervisor. It will also include an abstract of the proposed paper which would be given at the Congress if assistance is granted.
6. Award of assistance shall be judged on the following criteria: (i) Significance of the work to the community. (ii) Originality and soundness of the research. (iii) The progress made and whether the stage has been reached where something useful can be presented. (iv) Ability to present a clear and concise statement of the research study.
7. Applications and submissions must be lodged with Dr Richard Marchant, Museum of Victoria, 71 Victotia Crescent, Abbotsford, 3067, by the 1st of March 1988. The students to whom assistance is granted will be informed by 30th March 1988.

AWRAC's NATIONAL WATER RESEARCH SEMINAR, CANBERRA.

AWRAC (Australian Water Research Advisory Council) has been going through a lengthy process over the past year or two to try to decide which areas of research should receive federal funds. First, they commissioned 14 review papers covering most things aquatic, from the familiar territitory of water quality research, stream and lake ecology, through matters hydrological and engineering to the legal frameworks and socio economics of the water industry.

Next, five people were given the uneviable task of condensing this information into five thematic papers for discussions. The thematic papers were as follows: "Water resource management and a wider research content" by John Paterson. "Catchment and in-stream management" by Colin Porter. "Future directions for research into irrigation in Australia" by M.S. Bennett. "Future directions for research into major urban water and sewerage systems" by P.J. Crawford. "Research for the minor urban sector of the water industry". That should give you some idea of the breadth of issues AWRAC is supposed to take in, and it makes one feel very small indeed.

Phase three was the Seminar itself, held over two days (17-18 September) in Canberra. It was widely advertised in the newspapers (and even got mentioned in the ASL Newsletter!) and all you had to do was register an interest, register yourself (cost $150), get to Canberra and find a nice comfortable park bench to sleep on - or stay in a hotel (minimum of $48 per night). Having run your budget dry you could join the nearly 200 other people in the Lake something-or-the-other Room in the Lakeside Hotel and watch the fur fly. Have you ever tried to get >3 people to agree on anything? Can you imagine what it's like trying to get 200 people to agree on anything - other than when to have lunch? Well, it wasn't quite the pandemonium I was expecting and it was very well organised, especially since this was a first attempt at this sort of thing. So what was the seminar all about?

The basic aims were to draw out from each thematic field the major issues that needed research and to get some indication from The Floor as to how to set priorities on research projects within these issues. To do this, all delegates were circulated with a (somewhat lavish) book containing all 14 research reviews and all the thematic papers several weeks before the event. On the days in question, a 1 1/2 hr session was devoted to each theme which was kicked off by the author of the thematic paper giving a ten minute summary of his (they were all "hims") paper and then six invited speakers (who were sometimes "hers") were given five minutes each to comment on particular aspects before things were

thrown open to everyone on the floor to speak for three minutes maximum on aspects of the theme in question. The session was wound up by a rapporteur who had the unenviable task of making sense of it all. There was also a session entitled Dissenter's Corner to enable anybody to yell if they hadn't already, and of course a final summing-up session. Ambitious, huh? Did it work? By the admission of the summing-up person - John Paterson - only partially. Predictably, there was rather a lot of personal flag waving and not much identification of The Big Issues Facing Managers Now. From my own perspective, this was the biggest dissappointment. I had perhaps mistakenly viewed the collected research reviews as summarising what researchers felt were priorities and was hoping that the seminar would provide a forum for managers, farmers and administrators to express what their perceptions were of what should be most urgently funded. What identification of issues did occur was often at such an abstract level as to be uninformative. For example, we all know that salinity is a problem, but which bits need the most research first?

By and large, in my opinion, most sessions oscillated between vague platitudes and partisan group therapy, with little time spent in the middle trying to frame useful questions. Such shortcomings were frankly admitted by Paterson who then moved on to give certain segments of the engineering profession (the concrete kings and their alllies) a bit of a serve. Actually it was the sort of serve that made me very glad I wasn't an engineer; "I'm glad he's on our side", remarked a delegate from Warrnambool to me as the sound of bursting spleens reached pain levels. However, before we all heave a sigh of complacent relief that limnology is flavour of the month with AWRAC, the good Dr Paterson made it abundantly clear that federal money is flowing at the moment only to kick-start a long-neglected area of water research in much the same way that the Feds kick-started hydrographic research in the 1950s.

At some time in the future (not too far away, I suspect) AWRAC will be looking to State agencies and the private sector to pick up the tab. That is enough from me. We asked some of the ASL members who contributed to the research reviews to send us their impressions of what they thought of it all. One has politely declined, and all the others except Arthur McComb and Sam Lake have been too busy to meet the deadline. So here are some comments from some people other than me and a contribution from an interdisciplinary polymath who is *au fait* with management speak and would prefer to remain anonymous. If anyone else who attended the Seminar would like to air their views or try to contribute to the endless conundrum of getting managers and researchers to understand each other, PLEASE WRITE IN.

Leon Barmuta.

In these times of strident "economism" the water industry, like many other industries, cannot continue to expand its facilities but must manage its resources with greater efficiency. This new mood was recognised at the National Water Research Seminar but was not translated into tangible research priorities in water use and management organisation and goals. It was generally recognised at the Seminar that efficient management of water resources, necessarily encompasses environmental management based on ecological understanding.

This understanding must come from knowledge of both natural and maniuplated systems and involves understanding ecological processes at a number of different levels of scale - both spatially and temporally. The recognition of the need for ecological research was "endorsed" by the protests of those who felt mistakenly that ecological water research had already been well funded in Australia. While discrete research priorities were not obvious at the seminar, ecological research seems to be a very strong direction in the future.

P.S. Lake
Dept. of Zoology, Monash University.

I was fortunate to be among a small group of WA members who were able to cross the continent to attend the AWRAC seminar. I had read the 221 pages of background review papers and 46 pages of 'thematic papers', which provided some sort of filter for the multitude of possible research areas touched upon in the reviews. Then just before departing for the conference, we each received a 10-page digest about how the conference might proceed; this suggested that the 'water industry' should have the main say - indeed one diagram suggested the only say in determining national priorities.

The meeting was divided into 6 sessions, each addressing a theme. Each theme was introduced by a few keynote speakers, followed by a general invitation for comment, and then a raconteur's summary. In addition there was a 'dissenters corner' where people could air their views if they had not have an opportunity to speak, or wished to point out some omission, and finally there was a general session. All of these sessions were very well chaired, the venue was pleasant, and speakers kept to time. But it was rather difficult to generate a real discussion among delegates, who had to express their wish to speak on paper before each session started, then had to each walk to a microphone somewhere in the auditorium, announce their name and present a two minute statement.

You will appreciate therefore that what came out of the conference was a very large number of individual views rather than a consensus of opinion about what areas might be addressed. And as it happened, speakers from the water industry tended to talk more about policy matters and the need for diffusion of technology, rather than the definition of national research priorities.

One highlight was a splendid dinner at which the Chairman of the ARGS, Professor Don Aitken, spoke about the future of Australian scientific research. This was either gloomy or exhilarating, depending upon your view. He emphasised that although there is much excellent basic research going on in Australia, the country is simply unable to provide funds for all the basic research, assumed to be excellent, for which applications are received. Thus much of the selection for funding should be based on whether or not the proposed work is likely to have economic benefit to Australia. It was especially interesting to note the strong support for the formation of the Australian Research Council, and for many of the views subsequently expressed about tertiary institutions by Senator Dawkins.

We enter an interesting time, one where research will increasingly be driven by relevance to Australia's perceived need, and so in defined priorities areas. If there is any money available for research (!) surely those working on water stand a good chance of funding. AWRAC is faced with the task of distilling priority areas from a large number of suggestions which were not discriminated between at this stimulating meeting.

Arthur McComb, Botany Department,
University of Western Australia.

Before attending the National Water Research Seminar I somewhat (very) naively thought that I would come away from the Seminar well versed in the needs of water managers and administrators and ready to attempt to direct my research efforts in the areas which would best fulfil management-orientated objectives (provided of course I had the appropriate expertise and interest). However, management needs were not clearly revealed and whilst the reasons for this were varied and complex I would like to draw attention to the portion of blame which must be attributed to the aquatic research community.

It is the people actively engaged in research who are best equipped to suggest the areas both within their fields of study and in related areas to which further effort could be most effectivley and productively directed. The onus is on researchers to communicate the results of their work in a way that can be understood and applied by water managers. The repeated

suggestions by representatives of the AWWA before and during the Seminar that too much money is being directed to ecological research made it clear that a component of the water industry has little understanding of why a knowledge of the ecology of aquatic systems is desirable or important. Whilst the opinions of AWWA were drawn from a sample that could only be described as biased, the fact remains that limnologists must be prepared to communicate the findings of their research to a wider community than their peers and students. A start may be the presentation of current limnological research in an easily digested and understandable (to the non-specialist) form. Dr Ken Cummins drew attention to the need for effective forms of "technology transfer" at the Symposium on Stream Protection held at the Water Studies Centre at the Chisholm Institute of Technology in February 1985.
Very simply limnology needs to attain a higher profile if current research levels are to be maintained and expanded - and an obvious group to attempt to achieve this is ASL !

On a positive note :

-the organisation of the Seminar was excellent - that so many individual views could be heard was a feat of considerable proportions

- the bringing together of very disparate areas of water research, management and administration was an educational experience in itself

- the announcement of the Water Research Achievement Awards and the AWRAC / Water Industry sponsored postgraduate award scheme made the future look brighter for young limnologists

- the food was great!

Jenny Davis
Murdoch University, Western Australia.

The ongoing long term set of objectives that challenge the Water Industry were partially identified at the macrolevel to include a broad scale, synoptic, systematic, interdisciplinary, integrated, collaborative, hat-wearing, user-pays database to impact on market-oriented, multiobjective technology transfer and/or write-down assets with respect to customer-orienting the user-driven top-down or bottom-up soft costs in a complex and mature water economy with a flatter administrative structure.

Buzz Werd

AWRAC WATER ACHIEVEMENT AWARD

to

Dr Leon Barmuta

Congratulations to Leon Barmuta who recently won the inaugral Australian Water Research Advisory Council Award for the best PhD thesis on water research submitted in the past year (1986). The Award, valued at $1000, was for Dr Barmuta's research as described in his PhD thesis entitled " Community structure of macroinvertebrate benthos in an upland stream ".

Leon undertook his PhD research in the Zoology Department at Monash University under the supervision of Dr Sam Lake.

He is currently working with Dr Jenny Davis in the School of Biological and Environmental Sciences at Murdoch University, Western Australia, on a Water Authority funded Postdoctoral Fellowship on the biological monitoring of water quality in streams south of Perth. He is also associate investigator with Jenny Davis on an AWRAC funded project on the description of near-bed flows in Australian streams.

AWRAC WATER ACHIEVEMENT AWARD

to

Mr Bruce Weston

Congratulations to Bruce Weston who recently won the inaugral Australian Water Research Advisory Council Award for the best Masters thesis on water research submitted in the past year (1986). The Award, valued at $1000, was for Mr Weston's research as described in his Masters thesis entitled " The role of suspended sediment in the transport of phosphorus in fluvial systems ".

Mr Weston undertook his Masters research at the Water Studies Centre at Chisholm Institute of Technology under the supervision of Dr Barry Hart and Dr Ron Beckett.

Mr Weston is currently Head of the Environmental Sciences Unit within the Research Branch of the State Chemical Laboratories in Victoria. His current research is concerned with the development of alternative management techniques to ensure sustainable use of Victoria's soil and water resources.

LETTERS

AUSTRALIAN INSTITUTE OF BIOLOGY

Dear Colleagues,

I have recently been elected President of the Australian Institute of Biology. The objectives of the Institute are to represent the biology profession in Australia, to promote education and research in biology and to promote communication between biologists. The Australian Institute of Biology will aim to speak on behalf of professional biologists to all levels of government and the media. The Institute was inaugurated in 1986, as a fully independent organisation replacing the Institute of Biology in Australia which had been operating since 1983 as a branch of the British Institute of Biology. The U.K. parent body has a membership of about 17,000, is very active in public affairs and has been responsible for the introduction of the Higher National Certificate and Diploma in Applied Biology. The British Institute is also well-known for its publications Studies in Biology, Journal of Biological Education and Biologist. As its newly elected President, I would like to extend a cordial invitation to fellow limnologists to join the Institute. To do this simply write to The Membership Officer, Australian Institute of Biology, Science Centre, 35 Clarence Street, Sydney, NSW, 2000 to obtain application forms and further details.

I appreciate that with inflating prices and deflating dollar value and other pressures there are good reasons why one should not join yet another society or group of scientists. However, the Australian Institute of Biology is rather special for various reasons, not the least being that it can speak for professional biologists (including, of course, limnologists) on a variety of matters, many of which will probably fall outside the immediate area of interest of many specialist societies including our own. No other group can do so as effectively as the Institute and I think it would be wise not to expect either the Australian Academy of Science or ANZAAS to speak on behalf of biologists with particular enthusiasm (let's face it - they haven't done so far!). I look forward to welcoming you into the Institute.

W.D. Williams, FAIBiol.

FOOTROT FLATS

A SHARK HAS COME UP THE RIVER...
HE'S HEADIN FOR THE MURPHY'S PLACE...
I HOPE YOU KNOW THE DANGERS YOU'RE EXPOSIN' YOURSELF TO...
...OKAY, FORGET THE CROCO PIGS...
...CAN YOU LIVE IN PIG SEWERAGE AND CHEMICAL RUN-OFF?!

HYDROBIOLOGIA

I wish to advise that members of the editorial board of Hydrobiologia can act as regional editors. For Australia, this means that I can act in this capacity (and as such am meant to encourage good work to be published in Hydrobiologia, organise a refereeing circuit, and offer a conclusion to the Editor-in-Chief (Professor Dumont)). I raise this because members of the ASL who wish to publish in Hydrobiologia may care to submit papers directly to me than to Professor Dumont. I believe this will somewhat expedite the (possible) publication of their papers. At the same time, I should state that refereeing standards will remain as high as before, that referees will be drawn from the same pool (international and local), and that 'weak' papers will get the same sort of shift (short) as they would if submitted directly to Professor Dumont!

Regards, W.D. Williams, Department of Zoology, University of Adelaide GPO Box 498, Adelaide 5001.

Leon Barmuta trying to sell one only slightly used AWRAC Achievement Award to Michele Barson.

CHIRONOMID CONTROL

Each summer, residents living in houses built too close to urban wetlands in Perth "suffer" from being smothered by huge swarms of chironomid adults. Solutions to this problem include the possibility of filling in the wetlands, destroying the ecosystem with pesticides, or educating the residents to be tolerant. Such measures are either too drastic or impossible to achieve. A colleague of mine revealed that at the Kailue Drive-In on the island of Oahu, Hawaii, while he was watching "Tora! Tora! Tora!", mosquitoes were kept under control by a battery of very large (one square metre) UV insect 'zappers'. These zappers kept the mosquitoes in control but unfortunately incinerated large passing stick insects and moths.

West Australians could learn from Hawaiian drive-in operators. Around and even in the offending lakes, big UV zappers could be built and, at the appropriate times of the night when chironomid densities rise to suffocating level, the zappers could be switched on. The UV-blue light emitted would attract the delinquent chironomids and they would be cremated in an incandescent pyre. Indeed, the zappers, if carefully positioned and with high chironomid densities, could, on warm summer Perth nights, become an attraction - indeed a tourist attraction. People might come from far and wide to see the lakes during the festival of the zappers. Thus a nuisance could be turned into an asset - house prices around the lakes may rise as people seek to own properties in sight of the zappers. Western Australia may also acquire a new sunrise or sunset industry - the construction and operation of big zappers.

Tony Tarsus (address not supplied).

Bright idea to beat midges

By CARMELO AMALFI

FLOOD-LIT swamps may become the saviour of the backyard barbecue.

Six metropolitan councils are making a $30,000 study to determine if floodlamps placed in wetlands will attract pests such as mosquitoes and particularly midges away from residential areas.

Problem areas will be studied in Perth, Cockburn, Wanneroo, Stirling, Melville and Armadale.

Councillors believe that if the experiment is a success, people will no longer have to fret about infested washing hanging from clothes lines, midges covering car windscreens and mosquitoes ruining barbecue parties.

"It can drive housewives mad," said the Mayor of Cockburn, Cr Don Miguel.

"We spend about $24,000 a year to control midge and mosquito problems.

"By putting a great big light in the middle of the swamp we hope the insects will be attracted to it."

BOOK REVIEW

"STREAM PROTECTION: THE MANAGEMENT OF RIVERS FOR INSTREAM USES" (Ed. I.C. Campbell) Water Studies Centre, Chisholm Institute of Technology, Melbourne. 249 pp. 1986. Cost (including postage): $A20 in Australia, $A25 overseas. Available from: Water Studies Centre, CIT, East Caulfield 3145, Australia.
Reviewed by Richard Marchant, Museum of Victoria, 71 Victoria Crescent, Abbotsford 3067.

This book is the outcome of a symposium held in February 1985 at CIT and according to the editor is part of "a continuing series of symposia addressing contemporary issues in water quality management". By and large I think it fulfills this function well. The book contains 13 chapters and is aimed at an Australian or antipodean audience. The first five chapters tackle a wide range of topics: the ecology of stream communities, the hydrology of Australian streams, the riparian influence on streams, the effects of N.Z. forestry practices on stream communities, the use of buffer strips to control agricultural runoff.

The next six chapters deal with fish: the effects of changing land use on fish populations, flow and habitat requirements for native fish in Victoria, regulation of the Murray and its affect on native fish, fish passage in Australia, evaluation of methods for assessing flow requirements for native fish in northern NSW, flow requirements for N.Z. fish. The final two chapters discuss criteria for evaluating streams for protection and the complexities of protecting streams.

I found most of the chapters admirably brief yet interesting accounts of the topics outlined above. This is what you expect of contributions to such a symposium; the resulting papers are not meant to be encyclopaedic. A notable exception is the chapter on flow requirements for N.Z. fish, the first half of which (15 pages out of 29) is largely irrelevant; this half could have been adequately summarised in a page or two. I was also struck by the New Zealander's somewhat obsessive concern for their introduced salmonid fisheries, which is in marked contrast, it seems, to the concerns of inland fish managers in Australia. Undoubtedly there are good financial reasons for this, but I would like to have known something about the effects of flow regulation on N.Z. native freshwater fish.

I think this book could well be read profitably by managers of inland waters in both Australia and New Zealand. Its general lack of overwhelming technical detail should make it accessible to those without a strong background in limnology and increases its suitability for undergraduates. The book's greatest strength is this

potential to inform simply those members of the public who ought to know about stream protection. I found few misprints. There are repeated lines on p.39 and p.226 and missing words in a few places, e.g. p.188. "It's" is used as a possessive pronoun on p.172 and "methodologies" rears its ugly head occasionally: the correct word, according to any dictionary, is "methods". If multi-authored proceedings of conferences or symposia such as this are not to fall into disrepute, like some of the (justly termed) "grey" environmental literature, then at least a high standard of editing is required. Otherwise the debasement of this sort of literature will increase in an era of rapid publication.

ARTICLES

1. Biological research activities of the Alligator Rivers Region Research Institute (ARRRI) in the South Alligator River, N.T.

by Chris Humphrey, ARRRI.

The roles of the Supervising Scientist and the ARRRI include responsibilities to conduct research into and develop measures for environmental protection of the Alligator Rivers Region (NT) from the effects of the uranium mining operations in the Region. An amendment in May 1987 of the Environment Protection (Alligator Rivers Region) Act has extended these roles to include the provision of advice and undertaking of research into environmental protection associated with general (non-uranium) mining and exploration in a conservation zone declared in the Region. In particular, current emphasis centres on the recently declared conservation zone enclosed by Stage 3 of Kakadu National Park. This conservation zone covers a large part of the prospective mineralised province within the catchment of the Upper South Alligator River (SAR). An intensive five year exploration programme is to be carried out in this zone by mining companies to identify orebodies of significant economic value.

The research programme of the Supervising Scientist within the conservation zone is to focus initially on the environmental impact of exploration and mining at Coronation Hill, in the upper SAR, where assessed mineral reserves include significant deposits of gold and platinum group metals. Further developmental work has continued during 1986 and 1987 to define the extent of the deposits. Mining is proposed to commence in 1988. However, to receive Government approval to proceed to mining, the Coronation Hill Joint Venturers are required to submit an Environmental Impact Statement and subsequently comply with environmental requirements; these requirements would be expected to preclude

any impairment of water quality in the SAR. ARRRI biologists are presently acquiring baseline data on aquatic ommunities in the SAR adjacent to Coronation Hill in order to be in a position to assist in the development of the Government's environmental requirements for the project and to detect and assess any impact of mining upon the aquatic biota.

With declaration of Stage 3 of Kakadu almost the entire catchment of the SAR, the largest river in Kakadu, was included in the Park and conservation zone. Such incorporation of larger watersheds is certainly a rarity in the national parks of Australia and imparts particular conservation value to the SAR. Further, downstream of Coronation Hill the SAR flows into one of the most important and extensive wetlands of Kakadu, an area which is considered nationally and internationally to merit special concern and protection for the rich diversity of the biota it contains. Not that the environment of the upper SAR is pristine: Stage 3 of Kakadu comprises areas of two very large pastoral leases, Goodparla and Gimbat; in sections of the river there is evidence of buffalo damage ("clapped-out buffalo country") to riparian vegetation (and subsequent erosion); and a string of small abandoned uranium mines, worked in the 1950s, occurs along the northern escarpment face above the river. The purpose of the ARRRI research is to enable current exploration and future mining to take place in the secure knowledge that the highly valued environment of the Region is being adequately protected.

The aquatic research will take advantage of the fact that the South Alligator River near Coronation Hill is perennial and therefore will afford biological research aspects different from those already studied in the ephemeral Magela Creek near the Ranger uranium mine. The macroinvertebrate and fish (at least 24 species) faunas are particularly conspicuous, abundant and diverse, and will provide a substantial aquatic inventory on which to base environmental impact assessment of exploration and mining at Coronation Hill, including in the first instance, necessary pre-mining baseline data.

2.Environmental significance of fallen wood in the River Murray.

K.F. Walker and L.N. Lloyd, River Murray Laboratory, Department of Zoology, University of Adelaide, South Australia 5000. Article reprinted from Water News, No. 2. 1987.

River fishermen know that snags (submerged logs and branches) are more than a hazard for hooks; they are a likely place to catch fish. Fish will often lurk near snags, seeking refuge from the current and camouflage against predators and prey. In

the same way, many invertebrates and plants utilise this kind of shelter. The richness of species in a river community is an expression of the "patchiness" of the environment. From the viewpoint of a water engineer, however, a snag represents an obstruction to the efficient delivery of water. A river reach that is heavily endowed with snags will retard the flow of water, and the snags may encourage bank erosion or the development of sand bars. Under these circumstances, it seems justifiable to remove the fallen timber and restore a clear channel. That same solution appeals to the boatsman, for whom snags are a considerable danger, especially when lying concealed just below the surface. The effect of "desnagging" is to provide conditions more to the liking of the engineer and the navigator. On the other hand, where this work is carried out without regard for the biological role of snags, the effect is to deprive aquatic plants and animals of their habitat. Desnagging alters the local flow regime, redistributing the sediment and flushing areas once protected from the current, creating conditions that discourage many kinds of plants and animals. From the fisherman's viewpoint those fish which depend on snags as a refuge, or as a breeding site, are likely to decline. The problems involved in balancing these requirements are now receiving close attention from the River Murray Commission and other government agencies.

In addition, a three-year AWRAC-funded project has commenced, involving collaboration between the River Murray Laboratory, University of Adelaide and the Murray-Darling Freshwater Research Centre, Albury. The project's Research Officer, Lance Lloyd, recently completed a Master of Science thesis concerned with the small fish species of the lower Murray, and has had abundant experience in sampling river environments. Snags are a most conspicuous part of the Murray environment. Just as the riparian forests of river red gums (*Eucalyptus camaldulensis*) are littered by fallen branches that provide a habitat for small terrestrial animals, the river and its billabongs contain large amounts of submerged wood that are important for the survival of aquatic plants and animals.

In the "snags project" our main concern is with the fate of wood once it enters the water. A first goal has been to survey the world literature concerned with what is usually referred to as "coarse woody debris" in streams. North American colleagues have provided an enormous amount of relevant information, much of it drawn from the unpublished "grey literature" of governmental reports, and there have been many requests for further information about Australian work. Another goal, in these first few months, has been to begin a survey of the kinds of plants and animals associated with snags in the lower river. Our initial

efforts to sample snags directly, by gathering and cutting up submerged wood and sifting through the fragments, quickly proved too laborious for routine use. Although sampling of this kind will continue, we have had more success with collections taken from tied bundles of sticks moored at various stations for periods of several weeks. We have experimented with bundles of doweling rod (which are easily cleaned) and tree branches, and with other artificial samplers made from bundled onion bags (a corase mesh that is easily cleaned). Once retrieved from the water the bundles of sticks and branches are placed in a tray, untied and scrubbed using a simple nail brush. This provides a reasonably "clean" sample of the invertebrates associated with the algal and fungal growths that occur on the surface of the wood.

More elaborate techniques will be required for effective samples of the faster-moving inhabitants of snag environments, including shrimp (*Macrobrachium australiense*) and small-fish like carp-gudgeons (*Hypseleotris* spp.). These frequent the wood-surface and hollow branches, and are likely to dart away at the slightest disturbance. Later too, nets and electrofishing equipment will be used to confirm the importance of snags for larger fish like the Murray cod (*Maccullochella peeli*). Animals other than fish and invertebrates make extensive use of snags. They are resting places for tortoises, lizards and frogs, and feeding tables for water rats, and they are very often used as roosts by pelicans, cormorants and other birds associated with the river. Where possible, we plan to obtain quantitative information to substantiate these statements. The tedious and very difficult task of identifying the various species, especially the invertebrates, is one where we depend on the expertise of colleagues at other Universities and Museums throughout the world. We are also fortunate to have access to the voucher collection maintained by the Murray-Darling Freshwater Research Centre at Albury. This collection was established largely as a result of a recently-completed Biological Monitoring Program promoted by the River Murray Commission. Survey work at present is concentrated in a 5 km reach of the Murray below Lock and Weir 3, near Overland Corner, South Australia. This provides a good cross-section of riverine, billabong and backwater environments, and there are abundant snags. The snags are mainly of river red gum, although black box (*Eucalyptus largiflorens*), cooba (*Acacia stenophylla*) and weeping willows (*Salix babylonica*) are represented in some areas. Flows in the local aquatic environments are subject to very close regulation, and are typical of the Murray in South Australia.

Seasons Greetings

December 1987

SUN	MON	TUE	WED	THUR	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Christmas Day Friday 25th
Boxing Day Saturday 26th

If anyone would like a limnological calendar for 1988, please contact the editors.

Another part of the initial survey work has been to experiment with means of censusing snags. Because the Murray generally is so turbid as to preclude direct observation, we must either work with estimates using emergent snags, or with sonar methods. We have had some success with use of a modified echo-sounder, running transects parallel to the river banks over several kilometres. There is some interference near turbulent waters, due to the suspension of small bubbles, and we have discovered that large branches resting directly on the bed can be very difficult to identify from the traces. Otherwise, branches that are supported above the bottom show very clearly as clusters of points in the water column. Once our collecting and censusing techniques are refined, the survey will extend to other parts of the lower river, and to the river near Albury.

Later, the survey work will progressively give way to investigations concerned with such questions as: What is the rate of decompositon of submerged wood? We already know that snags may remain as a stable habitat for some time, but do not know how long they remain. Are some kinds of snags more important as plant and animal habitats? This might apply for different species of wood, or for wood in different stages of decomposition. Is the location of snags significant? For example, are snags in backwaters more productive than those in the main river channel? Are snags on the eroding margin of the river biologically different from those in more stable areas? Are different species associated with snags in different locations? What is the nature of the flow environment associated with snags? Work here will be linked to another project concerned, in part, with the hydrologic and hydraulic properties of snags. We hope that during the course of this study opportunities will arise to make direct observations of the effects of desnagging, although this will depend on the activities of the River Murray Commission and other management authorities.

The later stages of the project will address the basic aim of the entire project, namely to develop guidelines for desnagging that are sympathetic both to the needs of flow engineers and to the importance of snags as part of the Murray environment. There seems to be no reason why a moderate amount of desnagging cannot be carried out where necessary, provided that it is carried out in a manner consistent with the need to conserve the environment that gives the Murray its unique character.

HELP !!

TO ANYONE WHO HAS RECENTLY WET THEIR TOES IN LAKE JILLAMATONG - Would you please contact Brian Timms (Sciences Dept, Avondale CAE, PO Box 19, Corranbong NSW 2265; Ph: (049) 77 1107). He is most frustrated as the land owners at the lake keep telling him there is another crackpot scientist interested in their lake, but they cannot provide a name, and Brian, as yet, has not been able to track down the phantom limnologist. (By the way, L. Jillamatong lying as it does near Jindabyne on the Monaro Tableland, is Australia's highest saline lake.)

Tilapia wanted!!

If any persons in warmer Australian climes have come across any Tilapia (it's a fish, *Oreochromis mossambicus*, also called black bream, Mozambique mouthbrooder and a few other names) then the Tilapia Research Group, AES, Griffith University, Nathan, Qld 4111, would like to hear about it. It is illegal to transport this declared noxious species, so don't send 'em any through the mail; the posties would also get quite upset. If possible, take a photo, with some indication of size, and write to the Tilapia kids for a copy of their survey form, which also has a picture of the fish on it so you know what it looks like.

STATE AND TERRITORY AFFAIRS

This has proved to be a popular innovation, but IT NEEDS YOUR SUPPORT!! We know everyone is busy, but each of our regional correspondents is made even busier chasing other people up and finding out what you lot are up to. So if you feel that your area of interest or your research or management group has been missed out, if you feel that ASL is dominated by a bunch of crazed Victorian bug-pickers, IT IS YOUR FAULT. Happily, it is easy to remedy the situation. You can pick up a telephone and call your local gossip correspondent and tell her or him about any news at all that might be of interest to your limnological colleagues. If you are phobic of telephones and Australia Post are beneath your hi-tech dignity you can FAX things to Jenny Davis or Leon Barmuta on 2/3 (09) 332 2507. The only thing you are not allowed to do is whinge that you are being ignored. We know there are algologists, ichthyologists, engineers, geographers, botanists, sociologists and chemists out there: try communicating, someone might notice.

After that spiel, I bet you are thinking that we got scaly letters from pugilistic plankton workers, frazzled fisheries biologists and cantankerous chemists. Well, we didn't, but we felt a pre-emptive strike might be in order. STATE AND TERRITORY

AFFAIRS is not just a palce for airing the activities of the editors' mates, it is for everyone. Everyone would like to know things like staff movements, recent projects started or projects nearing completion, forthcoming events (even local ones), any visitors that have been or will come and what your graduate students are up to. Anything limnological at all. It doesn't have to be clever, funny, rude or rivetting, just newsworthy. And we especially encourage contributions from the non-tertiary sector. So here's the next thrilling installment of STATE AND TERRITORY AFFAIRS (anyone got a better title? - there's a freddo frog™ for a prize). This time we highlight those areas that didn't get much of a look-in last issue: N.T., S.A., Northern Queensland and Tasmania. Apparently very little is happening still in NSW (...er...got the message kids??).

A.C.T.

Correspondent: Richard Norris, Water Research Centre, School of Applied Science, CCAE, PO Box 1, Belconnen, ACT 2616.

As ever the Canberra CAE bods are keeping frenetically busy with Richard Norris already getting things together for the 1989 ASL Congress. Otherwise the wayward David Tiller is rumoured to be close to completing his write-up of his work on the macroinvertebrates of the Thredbo River. (I don't believe it - Ed.)

Victoria

Correspondent: Richard Marchant, Environmental Records, Museum of Victoria, 71 Victoria Cres., Abbotsford Vic. 3067.

As the solicitors move in on Andrew John Boulton, the Monash Zoology contribution is strangely muted. Meanwhile the spotlight shines elsewhere in the Garden State. Life has not been all that happy for biologists at the Arthur Rylah Institute, being badly hit by staff cut-backs. Rumour has it that such events even precipitated a strike by what few staff are left. However, there are still some fishy people carrying the flag (or is it the can?). John Koehn is now analysing all those marvellous data that he and Peter Jackson collected to work out the habitat requirements of river blackfish, tupong and *Galaxias brevipennis*. Meanwhile Peter Jackson has been seconded to work on planning and like projects in the River Management Section. And some further good news for the fish themselves is that a fish ladder is being installed on the Patterson River under the joint auspices of the Freshwater Fish Management Branch and the Dandenong Valley Authority.

Yes, there is some Monash News - Ros St Clair has submitted her thesis on Victorian Trichoptera. Well done Ros!

And finally a quick mention of what's on at the Centre For Stream Ecology - an AWRAC funded body involving collaboration between Monash University, Chisholm Institute of Technology and the Museum of Victoria. They have four research projects current; they are entitled:

1. Ecosystems and Community Structure Studies which consists of several "sub projects" looking at how space, food availability, predation and snags (log jams) affect stream faunas in several different systems.
2. Disturbance and Stream Communities. How do physical disturbances affect different bed types and the fauna that inhabits them?
3. Nutrient spiralling in Australian Streams. This project is developing methods for the real-time measurement and mathematical modelling of nutrient concentrations in streams.
4. Energy and Material Breakdown Studies - Include projects on the effects of riparian vegetation on stream biota, and on the timing and amounts of organic inputs into streams draining forested and cleared catchments. If you want to know more about these projects write to Barry Hart, Water Studies Centre, Chisholm Institute of Technology, Box 197, Caulfield East Vic. 3145.

South Australia

Correspondent: Lance Lloyd, Zoology Department, University of Adelaide, GPO Box 498, Adelaide, 5001.

Bill Williams continues his work on salt lakes and is involved in studies. WDW is presently finishing-up a completion report for the AWRAC study that he and Mike Kokkinn undertook in 1985/86 which focussed on saline lakes of the South East of South Australia. WDW will start a new research project in 1988 concerned with the validation of small subsets of salt lakes as indicators of real events. In December 1987, Bill will go to the USA for a week or so to work with Gene Likens. The main aim will be to complete a paper on the "imbalance" of northern hemisphere limnology, and the misperceptions held by northern hemisphere limnologists of what's important! Bill's Honours student this year, Mark Williams, is studying the salinity tolerances of Murray fish.

Mike Kokkinn, formerly Bill's RO, is now lecturing at Warrnambool Institute of Advanced Education. Bob Taaffe, who recently retired from the State Water Laboratories of Engineering & Water Supply, has begun some work with Bill on an analysis of the macroinvertebrate fauna of the Blackwood and Glenelg Rivers aimed at publication of the AWRAC study.

Dr John Melack and Dr Sally MacIntyre visited the Department of Zoology in late October. They gave two seminars - one on Mono Lake and another on Amazon floodplain lakes. They

also went on a short field trip to the salt lakes of the Coorong region.

Keith Walker (River Murray Laboratory) has been busy with several new projects. Apart from the snags project (see separate article), several other research and student projects have or soon will start. Martin Thoms, a fluvial geomorphologist/hydrologist of New Zealand origins but late of Loughborough University has joined RML to be the research officer on the "Weirs Project" ("The hydrological and ecological effects of weirs in the River Murray") which is an AWRAC-funded project. Martin is going to teach us "bug and weed" people (his words - don't blame me!) what is really important about the River.

Fran Sheldon has seen the light and returned from the West to begin a PhD with Keith on a yet to be defined project. Hugh Jones, from UNE via a few other places, is also going to do a PhD with Keith and he also can't decide what to do but has several ideas. Bryan Pierce continues his "shooting" work on carp and other fish and is looking to complete his thesis some time next year, which has a strong emphasis on recruitment processes in fish. Bryan's recent work involves the refinement of a photocell to measure algal densities in zooplankton cultures.

Jim Puckridge is continuing his study of the ecology of *Saprolegnia* epidemics in the lower Murray bony bream. However, his main research interest is now the use of floodplain habitats by freshwater fish. He has spent much of his time working on the unregulated Coopers Creek system and hopes to contrast his Cooper's findings with results from projected work on the over-regulated lower Murray.

Lance Lloyd, as well as the snags project, has been following-up (from his MSc work) some research related to the conservation of river blackfish and pigmy perch, both of which are having a hard time in the South Australian Murray. The whole limnology group will, no doubt, be concerned over the future conservation of the Cooper - as a totally unregulated major arid zone river, it is unique in South Australia, perhaps Australia. Plans of the NPWS to make the area a "regional reserve" will still allow mining, grazing, tourism and other developments which will affect its conservation status. Jim Puckridge has described the system as "priceless to Australian limnology" - contact him for more information. The River Murray Lab (mainly Keith, Jim and Lance) have been busy making comments on plans by E & WS to alter the Murray environment. Two salinity mitigation schemes and a River Murray management plan have involved the group in detailed submissions to E & WS. This has generated much discussion between the water engineers at Victoria Square (E & WS) and the ecologists on Victoria Drive (University). Basically, the

E & WS plan to remedy poor water management and irrigation practices with short-term engineering solution which have some considerable environmental costs. RML argues that better water management and irrigation practices are the preferred solution which has long-term environmental and water resource benefits.

Mike Geddes (also River Murray Lab) is busy with his continuing work with Parartemia including some work with Frank Conte (Oregon State University), who spent three months in Adelaide earlier this year. Frank tried to turn Mike's and Bill's Labs into high-tech *Artemia* cell biology and biochemistry labs - unsuccessfully to date. Mike also recently finished up some work looking at the limnology of fish hatchery ponds (at IFRS, Narrandera) with Phil Arumugam (now University Pertanian Malaysia) and Dave Culver (Univ. of Ohio). Mike has also been working on a revision of the Conchostraca (clamshrimps). SEM studies of eggs have been particularly rewarding and along with adult morphology should allow Limnadia to be sorted out after sixty years of abuse and indifference. Phil Arumugam who recently finished his PhD has returned to Malaysia to his lecturing post. Mike visited Phillip in Malaysia in January and Dave spent two weeks in Adelaide in March to continue the tri-continent collaboration.

Michael Pemberthy, a honours student supervised by Mike, is studying the growth variation in yabbies. Alice Wells is planning a trip to Malaysia next year to extend her work on the on the micro-caddis of the Western Pacific. At the moment, however, most of her time is consumed by undergraduate teaching. Andrew Sanger (formerly of University of Melbourne) joined the Department of Zoology (Univ. of Adelaide) earlier this year as a Tutor. Andrew recently completed his PhD on the ecology and taxonomy of blackfishes in SE Australia. Andrew, however, is moving on following his acceptance of a job in Tasmania with the Inland Fisheries Commission working on endangered galaxiids.

George Ganf in the Botany Department is still chairman but has found time to do some research. Jane Roberts, who recently completed her PhD thesis, has been busy discovering the River Murray and finding new research projects. Jane has many ideas but is yet to find funds to explore them. Chester Merrick is writing-up his thesis (Ra! Ra! Chester! - Eds). Naomi Rae is presently undertaking postgraduate studies on aquatic macrophytes of Bool Lagoon in the south east of South Australia. Armando Padovan, a past Honours student of GGG has shifted to CSIRO, Griffith to work on odour-producing algae in water supply reservoirs. Russ Shiel has just completed another massive field trip, this time some 5000 km circum-navigating Tasmania (by Kombi? - Eds).

Phil Suter (State Water Laboratories, E & WS) has been busy with the soon-to-be released "Murray Report" - a report covering the last five years of the RMCs monitoring programme of the River Murray which involved most state water authorities. Phil has been doing some interesting work looking at pesticides and chironomid deformities in a small stream which drains into Mt Bold reservoir. Deformities are displayed by some 19-50% of the chironomid population depending on location. Phil has just started to undertake some taxonomic work on burrowing mayflies from PNG which grow to 45 mm! He has also begun in earnest to solve the "Australian Caeniid Problem". Sally Sheelock has just started to work as Phil's assistant following Bob's retirement. Dennis Steffenson (SWL) has been investigating the "red-tide" algal bloom problem which has recently occurred in the Port "River" and West Lakes, both essentially marine systems. Mike Burch (SWL) is establishing a culture collection of toxic and odour-producing cyanobacteria for use in experimental work at the SWL. Some work to date has included copper tolerance testing and nutrient bioassay studies. He is also making a general collection of preserved freshwater algae from South Australia and would be grateful for specimens.

New South Wales

Correspondent: Rod Oliver, MDFRC, PO Box 921, Albury NSW 2640.

Well, it's not Rod's fault that nothing has happened in NSW in the last three months. We doubt that bicentennial funding will be available to help New South Welshpersons prepare their items for ASL gossip columns, so you'll have to do it for free. Meantime Brian Timms bravely soldiers on at Avondale CAE and has appealed for information about crackpot scientists visiting Lake Jillmatong near Jindabyne - see the article in the HELP!! column.

Northern Territory

Correspondent: Max Finlayson, Alligator River Region Research Institute, Post Office, Jabiru NT 5796.

First from the Toxicology Section of ARRRI, Doug Holdway bravely reports: The aquatic toxicology section has been very busy developing new protocols for biologically testing Ranger Uranium mine runoff waters prior to any releases to Magela Creek and therefore establishing 'safe' dilutions. The dilutions for release are based on no-observed-effect- concentrations in any species tested, and on a further safety factor to facilitate these activities. Dave Walden has been busy building a "state-of-the-art custom-designed 48-tank flow through bioassay system". Unfortunately, his eyesight has been threatened by constant squinting at small graduated cylinders while counting drops per second.

Helen Allison has been torturing hydras and teasing young virgin clam-shrimp into having lots of daughters on demand. Magda Wiecek has been given the onerous task of keeping our fish stocks happy (she does Polish folk dances to them) and preventing gross wife battering by our dominant purple-spotted gudgeons. Two more employees (a T.A. and an E.O.) will be joining this happy (mad?) crew shortly to replace employees now departed. Kym Brennan is finishing up a major work on how much metal is found naturally in local bird species (magnetic bird nests as the next tourist attraction?) and will be leaving on an extended holiday down South. (Why go down South???) The happy and rewarding task of co-ordinating all these fantastic "men and women of science" is keeping me (Doug Holdway) a dedicated member of the Jabiru Ruby Union team. The head butting keeps one's head clear (?) of any tensions (additional info from NT gossiper: "or alcoholic hazes"). For the uninitiated or inward looking limnologists of SA, WA, Vic and Tas the head-butt is an integral and fully excusable alternative to the pussy-footing, back-pocket play of the Oz rules (??) exponents (!) of the said states.

Next, Maryanne McKaige (C/- Dames and Moore, PO Box 2005, Darwin NT 5794) is paddling in non-crocodile infested waters at the head of the South Alligator River around Coronation Hill. She is collecting macroinvertebrates and says that the fauna looks like the stuff from "down south" but minus the stoneflies. Is there life without stoneflies? Finally, a mysterious communication from M. Finlayson himself says that he has just returned from a sojourn in Timor. What was he doing there? Looking for his shirt buttons? The mystery continues.

Tasmania

Correspondent: Pierre Horwitz, Centre for Environmental Studies, University of Tasmania, GPO Box 252C, Hobart Tas 7000.

The Tasmanian contact has changed since the last Newsletter because Alastair Richardson is on study leave. Pierre Horwitz has agreed to be the local correspondent and thanks to both Alastair and Pierre for providing the gossip for this Newsletter.

Great things are expected from the zoological side of freshwater interests at Univ. of Tas. with Alastair Richardson and Roy Swain now occupying new labs in the recently extended Zoology building. Alastair has just returned from the UK and Europe where he attended the International Association of Astacology meeting and presented a paper on work undertaken by himself and Pierre Horwitz on habitat separation in *Astacopsis*.

Freshwater projects currently in progress in Zoology include work by postgraduates Premek Hamar on *Astacopsis* reproduction. Jean Jackman on caddis, and by Honours student Peter Cerov on

the population structure of *Anaspides* in streams. Alastair Richardson and Roy Swain are hoping to start a project on freshwater systems in caves in 1988. Alastair is presently working on *Parastacoides* taxonomy and Bob White on galaxiid phylogeny.

Alastair Richardson (Zoology) and Peter Tyler (Botany) recently attended the Helsham Enquiry, the enquiry into the Lemonthyme and Southern Forests, to present reports on the streams and lakes within the area that would be affected by logging proposals. Wayne Fulton also attended the Enquiry on behalf of the Inland Fisheries Commission.

Pierre Horwitz is currently working as a lecturer in the Centre for Environmental Studies and preparing PhD work for publication.

The research group at the Inland Fisheries Commission are busy on a number of projects, so busy in fact that they were all in the field for a week when we rang so we look forward to a detailed description of their activities in the next Newsletter.

Queensland

Correspondents: North - Richard Pearson, Zoology Department, James Cook University, Townsville, 4811. South - Angela Arthington, AES, Griffith University, Nathan, 4111.

You asked for it.... a letter from the deep north.... For this first contribution I'll give a run-down on who's who in limnology in the north Queensland region and their main interests. This list will be biased in favour of members of the School of Biological Sciences, James Cook University, for obvious reasons. I apologise for any omissions - please contact me (i.e. Richard Pearson)!

Dilwyn Griffiths: Professor of Botany, JCU; Hydrobiology of tropical man-made lakes. Bob Congdon: Lecturer in Botany, JCU; nutrient budgets in rainforest catchments.

Leo Duivenvoorden: PhD student, JCU Botany Department, completing thesis on the hydrobiology of man-made lakes near Mt Isa.

Peter Hawkins: PhD student, JCU Botany Department, recently completed thesis on the hydrobiology of Lake Solomon, Palm Island and currently jaunting overseas.

Peter Farrell: Honours student, JCU Botany Department, water purification by aquatic macrophytes at Mt Isa.

Rhondda Jones: Professor of Zoology, JCU; interests include ecology of mosquitoes.

Norm Milward, Associate Professor of Zoology, JCU; freshwater fish and fisheries.

Ross Alford: Lecturer in Zoology, JCU; ecology of tadpoles of cane toads and native frogs. Richard Rowe: Lecturer in Zoology, JCU;

recently arrived from N.Z. and likely to work on dragonfly ecology.
Richard Pearson: Lecturer in Zoology, JCU; ecology of rainforest streams and the burdekin River (AWRAC project).
Ian Kneipp; Zoology Department, JCU; Research Officer for Burdekin River project.
Lee Benson: Zoology Department, JCU; Research Assistant on the Burdekin project; PhD student working on dynamics of organic material in a rainforest stream.
Leanne Fernandes: Zoology Department, JCU; Research Assistant on the Burdekin project; part-time MSc student.
John Faithfull: Zoology Department, JCU; Research Assistant on limnological study of the Burdekin Dam.
Ross Smith: PhD student, Zoology Department, JCU; completing thesis on the ecology of the rainforest stream atyid, *Australatya*; about to take up Kent Hortle's old job at Ok Tedi (look out, folks, Hortle's back in Melbourne).
Cathy Yule: PhD student,, Zoology Department, JCU; recently started work on life cycles of stream invertebrates at Bougainville Island.
Mark Hearnden: PhD student, Zoology Department, JCU; ecology of cane toad tadpoles.
Martin Cohen; PhD student, Zoology Department, ecology of cane toads. Jacqui Nolen: Honours student, Zoology Department, JCU; litter processing by caddis larvae in a rainforest stream.

Ian Campbell: Visitor to Zoology Department from Civilised Parts, and rather a pest; working on doubling Australia's consumption of diesel by having sample sites hundreds of kms apart. Says he's doing the taxonomy and life histories of our mayflies.
Joe Balciunas: Long-term visitor from Florida, looking for biological control agents for Australian aquatic plants introduced to the USA. JCU got support from AWRAC and the Queensland Water Resources Commission to form the Australian Centre for Tropical Freshwater Research. The Director is Ray Volker, Associate Professor in Civil and Systems Engineering, who has interests in hydrology and ground water dynamics. Richard Pearson is Deputy Director, waving the biological flag. Other staff associated with the Centre (apart from those listed above) have interests in hydrology, runoff and erosion, aquatic vectors of human and animal diseases, and water chemistry. The Centre is organising the 1988 ASL Conference at Magnetic Island - see elsewhere in this issue. Let us not forget those limnologically inclined at other institutions. John Benzie is doing his best to make the Australian Institute of Marine Science into his pet FW Institute.

Chris Barlow, Mal McKinnon *et al.* at the DPI Walkamin Research Station are active in freshwater fish culture and in promoting the need for research on the neglected Gulf rivers. And

Peter Mackey is battling the teaching odds to complete his work on the Fitzroy River at Rockhampton. The recent Townsville ANZAAS Conference had a good FW session which was well attended. Some Very Important Participants didn't make it (i.e. get here), but we were treated to several good expositions. Everyone warmed to Hortle's photos of a "typical day's catch" from the Fly River, which is the main attraction I think for Ross Smith. Clearly all is well with limnology in sunny NQ. All we need is a bleeding wet season!

Meanwhile Down South construction work is proceeding apace at Griffith University to house all those researchers that the new Centre will be employing. All the activity is certainly keeping Angela Arthington off the streets. *Tila pia*, everyone's favourite introduced fish is also exercising the minds of some Griffith bods. A plea for distributional information is published under the HELP!! column.

Western Australia

Correspondents: the editors

News from WA is sparse this month mainly because of the lengthy exposition in the last Newsletter.

Freshwater research in WA should be better co-ordinated in the future with the proposed formation of an Aquatic Ecosystem Research Sub-committee of the Research Steering Committee for Land Use and Water Supply. The primary objective of this committee will be to co-ordinate research on inland aquatic systems in Western Australia. The Sub-committee will comprise representatives from the following institutions : the Department of Conservation and Land Management, the EPA, the Water Authority, the Fisheries Dept. , Murdoch University and the University of Western Australia.

The Stream and Wetland Ecology Group at Murdoch University is going to have a busy summer with the recent start of a project to investigate control of nuisance non-biting midges (Diptera: Chironomidae) in wetlands in the Perth metropolitan region. Whilst midges are not considered to represent a health problem, the swarms that emerge from wetlands during the warmer summer months reach proportions that approach a nuisance factor of 10 (on the Richter Scale for midges), and elicit an extremely negative response from the residents of wetland suburbs. Research into the midge problem is being carried out by a group led by Jenny Davis and comprising Sue Harrington, Adrian Pinder and Natalie Hill. The project is being funded jointly by six local government Authorities and the Department of Conservation and Land Management.

Congratulations are due to Mark Lund , an Honours Student in the Biological Sciences Programme at Murdoch, who has just been awarded a Neville Stanley Studentship to investigate the potential of adult and larval midges as feed for aquarium fish. Mark will be attempting to turn a local problem into an asset. Mark is currently completing his Honours project at Murdoch with Drs Frank Murray and Jenny Davis on the biogeochemical cycling of lead in some Western Australian wetlands.

Visitors to the Centre for Water Research at UWA Dr John Melack and Dr Sally MacIntyre (both from the University of California at Santa Barbera) are about to start field work in Perth wetlands.

Finally, congratulations to Leon on the receipt of AWRAC's Water Research Achievement Award - more on that elsewhere in this Newsletter!

Limnological Societies Elsewhere

An occasional column briefly outlining the existence of other wet groups on the globe.

1. SIL - International Association of Theoretical and Applied Limnology. Those who went to the NZ Congress will know that SIL ain't what it used to be and wants to do something about it. In previous years SIL has stood tall and been effective at focussing attention on such limnological crises as cultural eutrophication and the degradation of critically important sites of scientific interest. No less an achievement has been its promotion of workshops and specialty groups to develop particular disciplines (e.g. primary productivity) and to highlight certain environments (e.g. salt lakes). Consequently SIL is in the process of revamping itself, and is hoping to get its membership (which is nearly as silent as that of ASL!) to suggest how the Society could deploy its limited resources more effectively. SIL is now publishing an annual newsletter and is eager to get things moving again. Membership isn't that expensive ($46 at the beginning of this year), is tax deductible and you can easily join by writing to the Australian representative, Graham Harris, CSIRO Marine Laboratories, GPO Box 1538, Hobart, Tasmania, 7001.

2. ILEC - International Lake Environment Committee. This is a recently formed Japanese-based non-government organisation which has received initial support from UNEP and Shiga Prefecture. From No. 4 of its newsletter, ILEC says that it is "to serve as a catalyst to promote environmentally sound

management of lakes. This is to be accomplished by international exchange of information on national management of lakes. ILECs activities include integration of a data-book on large lakes of the world, publicaton of guidelines, and organisation of workshops and training courses in co-operation with UN organisations, IGOs and NGOs. ILEC will participate in the implementation of the EMINWA Programme." No, I don't know what EMINWA is either. ILEC has already run one workshop in Sao Paulo in Brazil. If you want to find out more about ILEC or publicise anything through their newsletter, then write to ILEC Secretariat, C/- Shiga Prefectural Government, 4-1-1 Kyomachi, Otsu, Shiga 520, Japan.

3. NALMS - North American Lake Management Society. "NALMS, the only organisation with an unswerving focus on lakes" says the brochure. I wonder what a swerving focus looks like? NALMS organises international workshops, regional workshops, has an expertise data bank and a reserve of experts to feed into "public hearings and regulatory review processes. It also produces a bimonthly newsletter that makes this editor dribble with envy. It includes regular updates on State A federal (USA) changes in legislation, listings of current journal articles, JOB LISTINGS, news of coming events and (note, dear readers) "a running dialog between our members on current topics" (my emphasis). If you're a good little NALMS over-achiever you can win the Secchi Disk award! It sounds like a door prize, except I think they're serious. Anyway, sounds like we could learn a few tricks from this mob. To join NALMS ($US20 p.a.) write to PO Box 217, Merrifield, VA, 22116, USA.

COMING EVENTS

First, apologies to the NSWIT/SPCC Centre for Environmental Toxicology for not publicising their recent Seminar on fate and effects of endosulfan in the environment held on 28th August. Unfortunately their publicity reached the editors well after our last deadline. If you want to know what happened write to GPO Box 4036, Sydney NSW 2001.

1987

3-7 NOVEMBER: International Symposium, North American Lake Management Society, Orlando, Florida. Contact: NALMS, PO Box 217, Merrifield, VA, 22116, USA.

1988

FEBRUARY: International Symposium on Predation on Zooplankton by Organisms other than Fish, Broa, Sao Paulo State, Brazil. Contact: J.G. Tundisi, Limnological Laboratory, CRHEA Department of

Hydrology and Sanitation, USP Av. Dr Carlos Botelho, 1465 Sao Carlos, SP 12560 Brazil.

2-7 MAY: 4th International Symposium on Athalassic (Inland) Saline Lakes, SIL, Barcelona. Contact: Dr Francisco Comin, Departament d'Ecologia, Universitat de Barcelona, Diagonal 645, 08028 Barcelona, Spain.

13-15 MAY: ASL 27th Annual Congress, Magnetic Island, Townsville, Qld. Contact: R. Pearson, Department of Zoology, James Cook University, Qld 4811. Ph: 077 814540.

23-26 MAY: Murray Basin '88 - Geology, Groundwater and Salinity Management. Murray Basin Groundwater Committee, Canberra. Contact: Conference Secretariat, ACTS, GPO Box 2200, Canberra 2601. Ph: (062) 57 3256.

28-30 JUNE: National Seminar and Trade Expo: Managing the marine environment for a fishing future, Brisbane. Contact: Secretary, Steering Committee (Expo 88), Fisheries Management Branch, Queensland Department Primary Industries, GPO Box 46, Brisbane Qld 4001.

10-15 JULY: Conference on water quality and management for recreation and tourism, Brisbane. Contact: R. Sadler, PO Box 388, North Quay Qld 4000.

25-28 JULY: 10th International Symposium on Chironomidae, Debrecen, Hungary. Contact: Dr Gy. Devai, Secretary, Department of Ecology, L. Kossuth University, PO Box 14, M-4010 Debrecen, Hungary.

15-19 AUGUST: Fourth International Symposium on Regulated Streams, University of Technology, Loughborough, England. Contact: Dr G.E. Petts, Department of Geography, University of Technology, Loughborough, Leicestershire, LE11 3TU, UK.

28 AUGUST - 2 SEPTEMBER: Australian ecosystems: 200 years of utilization, degradation and reconstruction, Ecological Society of Australia, Geraldton, WA. contact: Dr R.A. How, Symposium Secretary, ESA, Western Australian Museum, Francis Street, Perth WA 6000.

29 AUGUST - 2 SEPTEMBER: First biennial water quality symposium: Microbiological aspects, Banff, Canada. Co-sponsors, WHO, PAHO, IDRC Ottawa, EC H & WC, AE. Contact: B.J. Dutka or D. Liu, National Water Research Institute, PO Box 5050, 867 Lakeshore Road, Burlington, Ontario, Canada L7R 4A6.

11-17 SEPTEMBER: Third International Conference on the conservation and management of lakes "Balaton '88", Hungary. Contact: Dr Sandor Herodek, Balaton Limnological Research Institute of the Hungarian Academy of Sciences. Tihany, POB 35, Hungary 8237.

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★ Inland Waters: As defined by the Coast Guard, areas of US territorial waters abutting or passing through heavily populated regions, where a man who falls overboard will disolve before he drowns.

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THESIS ABSTRACTS

1. Community structure of the macroinvertebrate benthos in an Australian upland stream, L.A. Barmuta (PhD thesis), Department of Zoology, Monash University, Victoria.

Community structure in lotic macrobenthos has been described with varying levels of resolution at many different scales, but rarely in conjunction with any explicit explanatory model. The several attempts to provide a theoretical basis for stream ecology are briefly reviewed. Despite their superficial dissimilarities, a recurrent theme at all scales has been that the structure of the habitat determines the faunal structure of the community. This idea was examined at a single site on a relatively undisturbed portion of the Acheron River in temperate Victoria. The stream bed could be divided into a number of easily distinguishable habitats, and the initial hypothesis was that these patches would support different associations of macroinvertebrates. Community structure was measured using multivariate techniques of displaying intersample similarity, diversity measures and functional feeding groups.

In terms of intersample similarity, the community did not bear a direct correspondence to the visually distinguishable habitats. The fauna was more consistent with a continuum model of community structure, rather than one based on a patch-specific or unit community model. Spatially, each sample could be placed on a gradient between depositional and erosional extremes. Amongst erosional samples, there was a marked seasonality, although the switch between summer and winter faunas was gradual rather than abrupt; seasonal changes in depositional habitats were less obvious due to the contraction of their areal extent during winter high flows. Species richness was greatest in erosional habitats although its quantitative dependence on sediment size was not as tight as found by some authors. Temporal changes were also less marked than reported by some comparable studies; the relatively benign hydrologic regime and stability of the bed of the Acheron River is suggested as a possible explanation. Variations in diversity (as measured by species abundance distributions) generally paralleled those for species richness. In this fauna conformation to the lognormal is clearly a function of sample size; recent attempts at using such distributions to assess disturbance or the equilibrial status of communities are, therefore, questionable.

Amongst feeding groups, only predators and scrapers showed expected relationships with their food resources; detritivorous groups were poorly correlated with the standing stocks of organic matter. This may indicate that benthic organic matter is relatively unimportant in determining community structure at this site, but may also partly result from the opportunistic feeding patterns of many collectors and scrapers and the coarse methods used to describe detrital distribution in the stream bed. The descriptive study suggested several hypotheses. One of these, involving the interaction of sediment size, current velocity and location in summer erosional habitats, was tested by field experiment. For most of the numerous taxa, current velocity or locational effects were more important than substratum type. Taxa that showed significant substratum effects usually preferred undisturbed control patches over the maniulated substrata, and generally showed no preference for either of the manipulated pebble sizes. These results indicate that epilithic resources and small-scale colonization events could be more important than pebble size in determining community structure within velocity regimes in summer. It is suggested that future investigations into macroinvertebrate community structure will benefit from a finer definition of both the resources utilised by and the life habits of the fauna than is presently offered by the functional classifications offered by the River Continuum Concept.

2. Studies on the macroinvertebrate fauna of rocks in the Taggerty River, Marysville: Distribution on rocks, influences of the epilithon and disturbance. Gabrielle Spangaro (Hons. thesis), Department of Zoology, Monash University, Clayton Vic.

The role of the epilithon in governing faunal distribution and abundance must be examined before recolonisation dynamics of lotic macroinvertebrates can be understood. Investigations conducted on rocks in a stream near Marysville, Victoria, found that more species and individuals occurred on the bottoms of rocks than on their upper surfaces. Epilithic algae (as chlorophyll-'a') were significantly more abundant on the tops of rocks, yet showed no correlations with faunal densities. Phaeophytin and epilithic organic matter also were uncorrelated with macroinvertebrate densities. Disturbance and reorientation of the epilithon by overturning rocks did not significantly alter the densities of half the resident species or the total species abundance. The other species declined in density and had not recovered to control levels after eight days.

Defaunated rocks with (brushed) and without (acid-scoured) epilithon exhibited the same pattern of recolonisation, although brushed rocks were colonised more rapidly and had higher faunal densities than acid scoured rocks to the end of the experiment (32

days). Faunal densities on acid-scoured rocks were significantly positively correlated with chlorophyll-'a' concentrations for five of the twenty most common species. Seven of the twenty most common species were significantly positively correlated with detrital organic matter on brushed and acid-scoured rocks. The results of these experiments are interpreted with reference to the feeding strategies and vagility of the common species and provide useful insights into the recolonisation of stones in upland Australian streams.

3. Factors of aquatic macrophytes that reduce their consumption by stream macroinvertebrates. Alistair Suren (Hons. thesis), Botany Department, Monash University, Clayton Vic.

From the results of this study, the following general conclusions can be drawn. The macrophytes do not attract or repel invertebrates significantly within the stream. Differences in distribution of animals between substratum and macrophytes do occur, but all the phytophagous invertebrates present on the substratum are present on the macrophytes. Macrophytes are eaten little, much less than one would immediately expect. The location of the macrophytes is not important. The drifting behaviour of the Trichopterans and the climbing and crawling locomotion of *P.niger* enable these animals to encounter the plants. The plants have no structural barriers which could repel the animals, whose mouthparts are morphologically capable of eating the plant.

The animals are not selecting their food on the basis of nutritional value alone, as the macrophytes are nutritionally richer than the animals' preferred food. Decomposed macrophyte tissue is eaten in preference to fresh tissue, due to the combined effect of enhanced nutritional value as a result of microbial conditioning, and of the destruction and loss of antiherbivore compounds from the plant. Boiling macrophyte tissue usually makes it more palatable to most of the animals, again due to the loss of gustatory repelling chemicals. For *P.niger*, however, boiling plant tissue reduces the consumption rate. This is due to the loss of attractant chemicals from the plant and the destruction of its periphyton community. The feeding of *T.ciuskus* on *T.procera* is strongly inhibited by the addition of fresh plant extract to the water. The concentration of the inhibitor within the test container affects the degree of inhibition, and boiling the extract reduces its inhibitory properties. *T.procera* is thus consumed less by *T.ciuskus* due to the presence of a heat labile antiherbivore compound.

While not tested, the other plants appear to possess similar chemicals which deter the animals from grazing. Certain species have overcome these chemicals and consequently can feed off the plants, as indicated in laboratory trials. This does not occur to any large extent in the field, possibly because there is an abundance of other food available.

4. Aspects of drift in a Victorian upland stream. P.G. Green (Hons thesis), Monash University, Clayton Vic.

Invertebrate drift was sampled on three occasions during April and August 1986 in Brittania Creek, a typical Victorian upland stsream. In April, an investigation into the spatial and temporal variation of drift was conducted. A nocturnal increase in the total density of the drift was observed, while the six most common taxa, analysed separately for diel drift patterns, all had nocturnal peaks (*Atalonella* spp., *Coloburiscoides* sp.2, *Baetis* sp., *Hydropsychidae* "Genus" M, *Riekoperla tuberculata*, and *Condocerus paludosus*). Drift densities differed across the stream, while the faunal composition and size distributions of common taxa were found to be homogeneous across the creek over a 24 h period. An investigation into the size distribution of one common taxon (*Atalonella* spp.) in the drift and benthos was conducted, and it was found that while in April there was a bias toward larger individuals in the drift, no such bias was observed in August.

Differences between the day and night size distributions of four common taxa were also studied. The larger individuals of *Atalonella* spp., *Coloburiscoides* sp.2 and Hydropsychidae "Genus" M displayed the greatest tendency to drift nocturnally, while this phenomenon was not recorded in a fourth species (*Baetis* sp.). In August an investigation into drift as a locally generated phenomenon was undertaken. It was concluded that in Brittania Creek, drifting invertebrates were not derived locally, i.e. from within a short distance (4.5 m) in front of the nets, but from a greater distance upstream.

THE 1989 CONGRESS

Richard Norris informs us that preparations for the 1989 Congress are well underway. The dates are 28-30 th April 1989, and it will be held at Canberra CAE in Belconnen. Registration will be in the vicinity of $50, and total costs including registration, meals, accomodation and transport to and from the airport should be less than $200. One or more post conference tours will be organised on Monday 31 st April.

★ A university is a collection of mutually repellant particles held together by a common interest in parking.

AUSTRALIAN WATER RESEARCH ADVISORY COUNCIL

WATER INDUSTRY RESEARCH AWARDS FOR POST GRADUATES

CALL FOR APPLICATIONS

The Australian Water Research Advisory Council (AWRAC) was established to advise the Commonwealth Government on water research.

The Council has recommended the establishment of Water Industry Research Awards to help strengthen water research capability by encouraging more graduates to complete a higher degree in a field of water research. The awards will be jointly funded by the Commonwealth Government and the water industry.

Copies of application forms and instructions to applicatns have been sent to the Research Administration Offices at most major research institutions and are also available from Ms Joan Chapman (062) 45 8242. Applications on photocopied forms will be accepted. Enquiries regarding the awards should be directed to Dr Michele Barson on (062) 45 8233. It is anticipated that the awards will be announced in March 1988.

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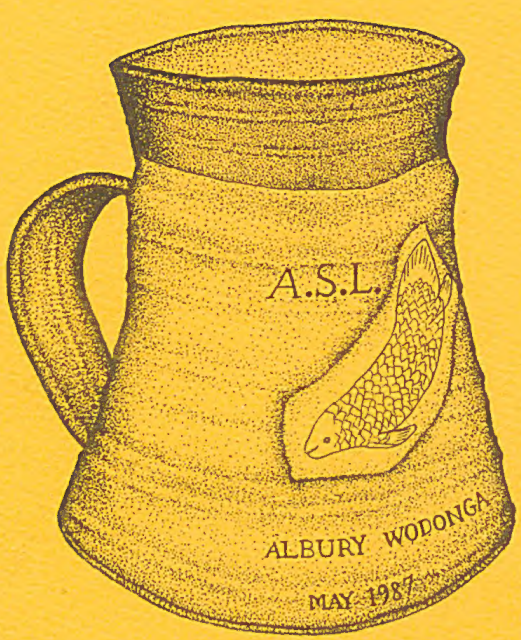

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